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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/702,755	11/01/2000	Nobutaka Nakamura	04329.2454	9386

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EXAMINER

LEFKOWITZ, SUMATI

ART UNIT	PAPER NUMBER
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2112

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/702,755

Applicant(s)

NAKAMURA, NOBUTAKA

Examiner

Sumati Lefkowitz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25 is/are allowed.
- 6) ☒ Claim(s) 20-24 and 26-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 20-37 are pending.

#### *Claim Objections*

2. Claims 32 and 35 are objected to because of the following informalities:
  - a. As to claim 32,
    - on line 3, "the computer system" should read –the data transfer apparatus—
  - b. As to claim 35,
    - on line 3, "the computer system" should read –the data transfer apparatus—

Appropriate correction is required.

#### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 26-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, the specification, on page 46, lines 5-11, states that when performing transmission using the second disclosed embodiment, namely via repeated transmission of blocks

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waiting for ACK, there is no need for a NACK transmitter, which means the receiver does not transmit any NACKs, as claimed in claims 27 and 28 and the receiver does not detect a discontinuity of identifier numbers of data received, as claimed in claim 26, but only the transmitter does.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al., 6,496,481 (hereinafter Wu) in view of Uota, 6,292,470.

As to claims 20-23, Wu discloses an apparatus comprising a transmitter that transmits data with a predetermined size (i.e., window size,  $W_o$ ,  $W_b$ ) to a receiver via a serial transmission, the data having an identifier number, and a buffer (note column 9, lines 39-66) that is coupled to the transmitter and stores transmitted data, and wherein the transmitter repeatedly transmits the transmitted data stored in the buffer, and terminates transmitting the transmitted data if an affirmative acknowledgement indicates that the identifier number of data that is received by the receiver is returned from the receiver (note column 3, lines 31-44 and column 13, lines 23-43, wherein the fact that data is preemptively retransmitted in multiple copies for packets which have not been ACKed reads on repeatedly transmitting data until an affirmative acknowledgement is received), wherein the transmitter purges the transmitted data stored in the

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buffer if the affirmative ack indicates that the transmitted data is received from the receiver (note column 9, lines 39-66), wherein the transmitter completes a transmission of the data even when a response for the transmitted data is returned from the receiver, once the transmitter has started to re-transmit the data stored in the buffer (note column 7, lines 1-5 and lines 11-13), wherein the transmitter and receiver have the same configuration (note Figures 17-19 and column 9, line 39 – column 10, line 14, wherein both have buffers determined by  $n$  and  $t_p$ ).

Wu fails to disclose that the data has an error check signal, but does disclose that more robust error correction methods on the packet header may be used for a more reliable implementation of the data transfer method (note column 8, lines 61-66).

Uota discloses that the data has an error check signal (note Figure and column 3, lines 51-61).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the use of an error check signal, as Uota teaches, in the system of Wu as an additional means of providing reliable and accurate data transfer between a transmitter and receiver.

6. Claims 24 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al., 6,496,481 (hereinafter Wu) in view of Uota, 6,292,470, as applied to claims 20-23 above, and further in view of Ahern, 6,070,214.

a. As to claim 24, Wu fails to disclose that the transmitter and receiver have respective configuration registers.

Ahern discloses that the transmitter and receiver have respective configuration registers (note Figures 1 and 2 and column 12, lines 1-3).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the use of a transmitter and receiver, each with its own configuration registers, as Ahern teaches, in the system of Wu so as to allow for the expansion of the computer system of Wu through the use of a fiber optic, point-to-point link between first and second bridge controllers, with the fiber optic link providing substantially higher data transfer rates and longer transmission distances compared to traditional computer buses, high noise immunity and low error rates.

b. As to claims 32-34, Wu discloses a data transfer apparatus comprising a transmitter that repeatedly transmits a predetermined number of blocks (i.e., window size,  $W_o$ ,  $W_b$ ) of data to a receiver without waiting for a response from the receiver, the transmitted blocks of data having consecutive identifier numbers (note Figure 3a, packet sequence number), a response unit that transmits from the receiver to the transmitter the response when the second controller correctly receives a block of data, the response having the identifier number of the received block of data, a manager (i.e., sender) that detects the identifier number of the latest response and a transmission controller (i.e., part of sender) that makes the transmitter repeatedly transmit another predetermined number of blocks of data from the transmitter to the receiver without waiting for a response from the receiver, the another predetermined number of blocks of data having identifier numbers that follow the identifier number of the latest response (note column 3, lines 31-44 and column 13, lines 23-43).

Wu fails to disclose that data required to transmit a bus transaction is transmitted between first and second controllers respectively connected to first and second buses.

Ahern discloses that data is transmitted serially between a first controller provided at a

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host device and a second controller provided at an expansion unit, the first and second controllers respectively connected to first and second buses, the configuration of the first controller is the same as a configuration of the second controller and the first controller and second controller have respective configuration registers (note Figures 1 and 2 and column 12, lines 1-3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the use of a first and second controllers connected via a serial transmission path, as Ahern teaches, in the system of Wu so as to allow for the expansion of the computer system of Wu through the use of a fiber optic, point-to-point link between first and second bridge controllers, with the fiber optic link providing substantially higher data transfer rates and longer transmission distances compared to traditional computer buses, high noise immunity and low error rates.

7. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha, 5,699,369 in view of Ahern, 6,070,214 and Drynan et al., 4,617,657 (hereinafter Drynan).

As to claims 29-31, Guha discloses a data transfer apparatus comprising a transmitter that transmits a predetermined number of blocks of data to a receiver without waiting for a response from the receiver, the transmitted blocks of data having consecutive identifier numbers, a response unit that transmits from the receiver to the transmitter the response when the receiver correctly receives a block of data and a retransmission request when the receiver does not correctly receive a block of data, the response having the identifier number of the received block of data, a manager that detects an identifier number of the latest response, wherein the transmitter, when the response is received, transmits to the receiver a block of data having an

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identifier number that follows the identifier number of the latest block of data transmitted from the transmitter, and when the re-transmission request is received, transmits to the receiver a second block of data having an identifier number that follows the identifier number of the latest response (note column 8, line 57 – column 9, line 2, wherein Guha discloses that if the sender does not receive the proper sequence of ACKs, which implies that the ACKs are numbered sequentially and the packets transmitted sequentially according to their sequence numbers, retransmission would be performed using a Go-Back-N algorithm, evidence of which may be found in Lin et al., 4,344,171, on column 1, line 25 – column 2, line 21 and column 3, lines 26-48 and Figure 1).

Guha fails to disclose a first controller and a second controller or that the retransmission request has no identifier number.

Ahern discloses a first controller and a second controller, wherein the configuration of the first controller is the same as the configuration of the second controller, and wherein the first controller and the second controller have respective configuration registers (note Figures 1 and 2 and column 12, lines 1-3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the use of a first and second controllers connected via a serial transmission path, as Ahern teaches, in the system of Guha so as to allow for the expansion of the computer system of Guha through the use of a fiber optic, point-to-point link between first and second bridge controllers, with the fiber optic link providing substantially higher data transfer rates and longer transmission distances compared to traditional computer buses, high noise immunity and low error rates.



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Drynan discloses that the retransmission request has no identifier number (note column 2, lines 25-41).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have the retransmission requests not include identifiers, as Drynan teaches, in the system of Guha so as to allow for operation in a case where the sequence number of a packet received in error has been corrupted and therefore is unknown, as Drynan teaches in column 2, lines 25-41.

8. Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha, 5,699,369 in view of Ahern, 6,070,214 and Drynan et al., 4,617,657 (hereinafter Drynan).

As to claims 35-37, Guha discloses a data transfer apparatus in which data required to transmit a bus transaction is transmitted between a transmitter and receiver, the data transfer apparatus comprising a first transmitter that transmits a predetermined number of blocks of data from the transmitter to the receiver without waiting for a response from the second controller, the transmitted blocks of data having consecutive identifier numbers, a response unit that transmits from the receiver to the transmitter the response when the receiver correctly receives a block of data, the response having the identifier number of the received block of data, an error detector that detects a link error between the transmitter and the receiver when the transmitter receives responses having nonconsecutive identifier numbers (note column 8, line 57 – column 9, line 2, wherein Guha discloses that if the sender does not receive the proper sequence of ACKs, which implies that the ACKs are numbered sequentially and the packets are transmitted sequentially according to their sequence numbers, retransmission would be performed using a Go-Back-N

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algorithm, evidence of which may be found in Lin et al., 4,344,171, in column 1, line 25 – column 2, line 21 and column 3, lines 26-48 and Figure 1).

Guha fails to disclose an error recovery processing unit or a first controller and a second controller.

Dolkas discloses an error recovery processing unit that repeatedly exchanges a predetermined bit pattern between the transmitter and the receiver and transmits from the receiver to the transmitter a re-transmission request (i.e., REJ) requesting retransmission of the blocks of data that are not correctly received by the receiver when a condition in which a serial data transfer between the transmitter and the receiver is met (i.e., when synchronization is achieved), and a second transmitter (note Figure 4, element 135) that retransmits a block of data from the transmitter to the receiver which is requested by the retransmission request (note column 7, lines 15-24 and column 11, lines 44-60 and column 13, lines 52-62 and column 16, lines 3-7 and column 17, lines 16-29).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have an error recovery processing unit, as Dolkas teaches, in the system of Guha so as to allow the receiver to retain or regain synchronization even in the presence of link induced errors, as Dolkas teaches in column 7, line 15-24.

Ahern discloses a first controller and a second controller, wherein the configuration of the first controller is the same as the configuration of the second controller, and wherein the first controller and the second controller have respective configuration registers (note Figures 1 and 2 and column 12, lines 1-3).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the use of a first and second controllers connected via a serial transmission path, as Ahern teaches, in the system of Guha so as to allow for the expansion of the computer system of Guha through the use of a fiber optic, point-to-point link between first and second bridge controllers, with the fiber optic link providing substantially higher data transfer rates and longer transmission distances compared to traditional computer buses, high noise immunity and low error rates.

***Allowable Subject Matter***

9. Claim 25 is allowed.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, as the prior art teaches or suggests various, well known sliding window, serial transmission/retransmission protocols, including GO-BACK-N ARQ, SR-ARQ, RLP, and variations of each.

US Patents:	6,662,330	Hershey	6,658,619	Chen
	6,621,796	Miklos	6,574,668	Gubbi et al.
	6,563,826	Shikama	6,425,105	Piirainen et al.
	6,389,016	Sabaa et al.	6,335,933	Mallory
	6,330,699	Yoshioka et al.	6,301,249	Mansfield et al.
	6,181,704	Drott et al.	6,091,733	Takagi et al.
	6,069,886	Ayerst et al.	6,021,124	Haartsen

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5,931,916 Barker et al.	5,930,233 Kanerva et al.
5,892,894 Shiroshita et al.	5,828,677 Sayeed et al.
5,734,659 Mann et al.	5,629,948 Hagiwara et al.
5,477,550 Crisler et al.	5,313,473 Darmon et al.
5,136,576 Brownlie	4,726,027 Nakamura et al.
4,144,522 Kageyama et al.	

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sumati Lefkowitz whose telephone number is 703-308-7790. The examiner can normally be reached on Monday-Friday from 6:00-2:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached at 703-305-48154815.

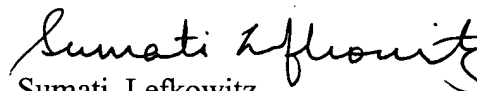
The fax phone numbers for the organization where this application or proceeding is assigned are:

703-746-7238 for After-Final communications

703-872-9306 for Official communications

703-746-5661 for Non-Official/Draft communications

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

  
Sumati Lefkowitz  
Primary Examiner  
Art Unit 2112

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February 20, 2004